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Building & Highway Material Testing Laboratory
An ISO 9001:2008 Certified Company
NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

Job No.: CTCE/BBMP/KRIDL/W.No.13/BC/Sp_Wa/2018-19 27.04.2018

TEST REEPORT ON SPECIFIC GRAVITY AND WATER ABSORPTION

* Customer	:	**Asst. Executive Engineer,** Dasarahalli Project Division, BBMP, Bangalore.
* Agency	:	**Technical Manager,** KRIDL, Bangalore.
* Name of Work	:	Improvements of asphalting at Kalyana Nagara and surrounding area in Mallasandra Ward No.13, Shettyhalli Sub Division, BBMP, Bangalore.
* Reference	:	BBMP/EE/PD/WO/000032/2017-18 Dated: 22.02.2018
* Sample ID	:	Hot mix plant, Bangalore
Technical Reference	:	IS : 2386(Part -3)-1963 (RA-2011)
* Type of Mix	:	Bituminous Concrete
Date of Testing	:	27.04.2018

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2022	2028	2027	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1239	1238	1272	
4	Weight of saturated surface dry aggregate in air	W_3 g	2018	2011	2015	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	779	773	743	
6	Weight of oven dried aggregate	W_4 g	2005	2002	2006	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.574	2.590	2.700	2.621
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.617	2.620	2.733	2.657
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.65%	0.45%	0.45%	0.52%

*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

Note:

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Job No: CTCE/BBMP/KRIDL/W.No.13/BC/Bitumen/2018-19 27.04.2018

TEST REPORT ON BITUMEN CONTENT OF BITUMINOUS CONCRETE MIX

* Customer	:	**Asst. Executive Engineer,** Dasarahalli Project Division, BBMP, Bangalore.
* Agency	:	**Technical Manager,** KRIDL, Bangalore.
* Name of Work	:	Improvements of asphalting at Kalyana Nagara and surrounding area in Mallasandra Ward No.13, Shettyhalli Sub Division, BBMP, Bangalore.
* Reference	:	BBMP/EE/PD/WO/000032/2017-18 Dated: 22.02.2018
* Sample ID	:	Roads at Kalyana Nagara area Ward No.13
Technical Reference	:	IRC:SP:11-1984
Date of Testing	:	27.04.2018

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	470	469
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	30	31.00
7. Bitumen content in %	6.00	6.20
8. Average	**6.10**	

*Information is furnished by the Customer/Representative.

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Job No: CTCE/BBMP/KRIDL/W.No.13/BC/Bitumen/2018-19 27.04.2018

TEST REPORT ON BITUMEN CONTENT AFTER GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

* Customer	:	**Asst. Executive Engineer,** Dasarahalli Project Division, BBMP, Bangalore.
* Agency	:	**Technical Manager,** KRIDL, Bangalore.
* Name of Work	:	Improvements of asphalting at Kalyana Nagara and surrounding area in Mallasandra Ward No.13, Shettyhalli Sub Division, BBMP, Bangalore.
* Reference	:	BBMP/EE/PD/WO/000032/2017-18 Dated: 22.02.2018
* Sample ID	:	Roads at Kalyana Nagara area Ward No.13
Technical Reference	:	IS 2386 and IRC:SP:11-1984
Date of Testing	:	27.04.2018

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	36.52	7.77	7.77	92.23	79-100
9.5	35.26	7.50	15.27	84.73	70-88
4.75	70.45	14.99	30.26	69.74	53-71
2.36	66.52	14.15	44.41	55.59	42-58
1.18	54.48	11.59	56.01	43.99	34-48
0.6	53.26	11.33	67.34	32.66	26-38
0.3	47.82	10.17	77.51	22.49	18-28
0.15	36.93	7.86	85.37	14.63	12-20
0.075	33.12	7.05	92.42	7.58	4-10

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	32.58	6.95	6.95	93.05	79-100
9.5	48.56	10.35	17.30	82.70	70-88
4.75	65.92	14.06	31.36	68.64	53-71
2.36	75.48	16.09	47.45	52.55	42-58
1.18	66.32	14.14	61.59	38.41	34-48
0.6	52.63	11.22	72.81	27.19	26-38
0.3	32.85	7.00	79.82	20.18	18-28
0.15	25.85	5.51	85.33	14.67	12-20
0.075	36.23	7.72	93.05	6.95	4-10

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Job No.: CTCE/BBMP/KRIDL/W.No.13/BC/Agg/2018-19 27.04.2018

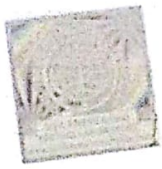
TEST REPORT ON GRADATION OF AGGREGATE

* **Customer** : **Asst. Executive Engineer,** Dasarahalli Project Division, BBMP, Bangalore.
* **Agency** : **Technical Manager,** KRIDL, Bangalore.
* **Name of Work** : Improvements of asphalting at Kalyana Nagara and surrounding area in Mallasandra Ward No.13, Shettyhalli Sub Division, BBMP, Bangalore.
* **Reference** : BBMP/EE/PD/WO/000032/2017-18 Dated: 22.02.2018
* **Sample ID** : Bituminous Concrete

Technical Reference : IS : 2386(Part -1)-1963 (RA-2011)

* **Type of Mix** : Hot mix plant, Bangalore

Date of Testing : 27.04.2018



Total Weight of Sample: **5250** gm

Sieve Size, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per 'MORTH 500-18
13.2	795	15.14	15.14	84.86	79 - 100	
9.5	575	10.95	26.10	73.90	70 - 88	
4.75	615	11.71	37.81	62.19	53 - 71	
2.36	620	11.81	49.62	50.38	42 - 58	
1.18	510	9.71	59.33	40.67	34 - 48	
0.600	555	10.57	69.90	30.10	26 - 38	
0.300	515	9.81	79.71	20.29	18 - 28	
0.150	325	6.19	85.90	14.10	12 - 20	
0.075	275	5.24	91.14	8.86	4 - 10	

Total Weight of Sample: **5350** gm

Sieve Size, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH 500-18
13.2	530	9.91	9.91	90.09	79 - 100	
9.5	625	11.68	21.59	78.41	70 - 88	
4.75	615	11.50	33.08	66.92	53 - 71	
2.36	585	10.93	44.02	55.98	42 - 58	
1.18	620	11.59	55.61	44.39	34 - 48	
0.600	545	10.19	65.79	34.21	26 - 38	
0.300	520	9.72	75.51	24.49	18 - 28	
0.150	375	7.01	82.52	17.48	12 - 20	
0.075	425	7.94	90.47	9.53	4 - 10	

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Job No.: CTCE/BBMP/KRIDL/W.No.13/BC/Stability/2018-19 27.04.2018

TEST REPORT ON MARSHALL STABILITY OF MIX

* Customer	:	**Asst. Executive Engineer,** Dasarahalli Project Division, BBMP, Bangalore.
* Agency	:	**Technical Manager,** KRIDL, Bangalore.
*Name of the Work	:	Improvements of asphalting at Kalyana Nagara and surrounding area in Mallasandra Ward No.13, Shettyhalli Sub Division, BBMP, Bangalore.
*Reference	:	BBMP/EE/PD/WO/000032/2017-18 Dated: 22.02.2018
* Source	:	Hot mix Plant, Bangalore
* Type of Mix	:	Bituminous Concrete
Date of Testing	:	27.04.2018

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshall Stability (Kn at 60°C)	9.95	10.15	9 Kn (min)
2	Marshall flow (mm)	2.50	3.30	2 – 4
3	Voids in Compacted Mix %	3.25	4.35	3 – 6
4	Percent voids in Mineral Aggregate (VMA)	14.35	14.55	13 - 15
5	Percent Voids filled with Bitumen (VFB)	69.50	70.30	65 - 75
6	Density, g/cc	2.28	2.27	--

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